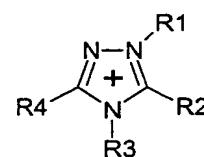
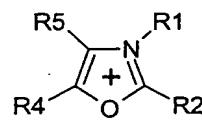
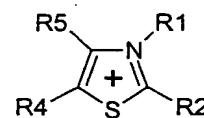
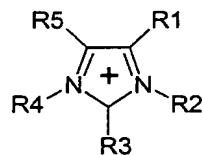
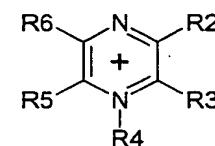
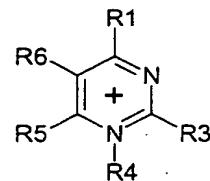
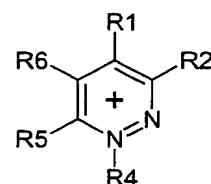
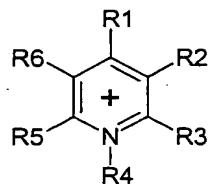


PATENT CLAIMS

1. Process for the preparation of bis(perfluoroalkyl)phosphinic acids or salts thereof comprising at least the following process steps:
 - a) reaction of at least one difluorotris(perfluoroalkyl)phosphorane or at least one trifluorobis(perfluoroalkyl)phosphorane with hydrogen fluoride in a suitable reaction medium, and
 - b) heating of the reaction mixture obtained in a).
2. Process for the preparation of bis(perfluoroalkyl)phosphinic acids or salts thereof according to Claim 1, characterised in that the salts are prepared by subsequent neutralisation.
3. Process according to Claim 1, characterised in that the difluorotris(perfluoroalkyl)phosphorane or trifluorobis(perfluoroalkyl)phosphorane employed is a compound of the general formula I
$$(C_nF_{2n+1})_mPF_{5-m}$$
I
in which $1 \leq n \leq 8$, preferably $1 \leq n \leq 4$, and m in each case = 2 or 3.
4. Process according to Claim 1, characterised in that the difluorotris(perfluoroalkyl)phosphorane employed is a compound selected from the group consisting of difluorotris(pentafluoroethyl)phosphorane, difluorotris(n-nonafluorobutyl)phosphorane and difluorotris(n-heptafluoropropyl)phosphorane.

5. Process according to Claim 1, characterised in that the trifluorobis-(perfluoroalkyl)phosphorane compound employed is trifluorobis(n-nonafluorobutyl)phosphorane.
- 5 6. Process according to Claim 1, characterised in that the temperature during the heating in process step b) is from room temperature to 150°C, preferably from 100°C to 145°C, particularly preferably from 135 to 140°C.
- 10 7. Process according to Claim 1, characterised in that the duration of the heating in process step b) is from 1 to 150 hours, preferably from 10 to 25 hours, particularly preferably from 18 to 22 hours.
- 15 8. Process according to Claim 1, characterised in that the reaction medium is water or a water-based mixture.
- 15 9. Process according to Claim 2, characterised in that bases, preferably hydroxides, oxides, hydrides, amides, carbonates, phosphines or amines, are used to prepare the salts.
- 20 10. Salts of bis(perfluoroalkyl)phosphinic acids selected from the group consisting of partially alkylated and peralkylated ammonium, phosphonium, sulfonium, pyridinium, pyridazinium, pyrimidinium, pyrazinium, imidazolium, pyrazolium, thiazolium, oxazolium and triazolium salts salts.
- 25 11. Salts of bis(perfluoroalkyl)phosphinic acids according to Claim 10, having a cation selected from the group consisting of



where R¹ to R⁵ are identical or different, are optionally bonded directly to one another by a single or double bond and are each, individually or together, defined as follows:

- H,
- halogen, where the halogens are not bonded directly to N,
- an alkyl radical (C₁ to C₈), which may be partially or completely substituted by further groups, preferably F, Cl, N(C_nF_(2n+1-x)H_x)₂, O(C_nF_(2n+1-x)H_x), SO₂(C_nF_(2n+1-x)H_x), C_nF_(2n+1-x)H_x, where 1 < n < 6 and 0 < x ≤ 2n+1.

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12. Use of the salts of bis(perfluoroalkyl)phosphinic acids according to Claim 10 or 11 as ionic liquids.
13. Use of the salts of bis(perfluoroalkyl)phosphinic acids according to Claim 10 or 11 as phase-transfer catalyst or surfactants.

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